Saint-Petersburg State University Graduate School of Management
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THE ROLE OF KNOWLEDGE MANAGEMENT PROCESSES IN INNOVATION PERFORMANCE: THE EVIDENCE FROM RUSSIAN COMPANIES

Master's Thesis by 2st year student
Concentration – Master in Management
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ЗАЯВЛЕНИЕ О САМОСТОЯТЕЛЬНОМ ХАРАКТЕРЕ ВЫПОЛНЕНИЯ ВЫПУСКНОЙ КВАЛИФИКАЦИОННОЙ РАБОТЫ

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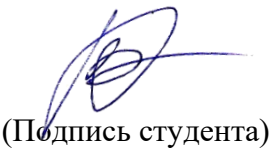

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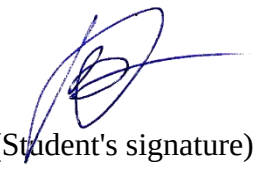

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Описание цели, задач и основных результатов:	Целью данного исследования является изучение влияния практик управления знаниями на инновационную активность в российских компаниях. Особенностью исследования является фокус на изучении влияния не абстрактных процессов управления знаниями, а систематической управленческой деятельности, напрямую касающейся работы со знаниями. Такая модель исследования еще ни разу не применялась для изучения практик управления знаниями в России. Источником данных является опрос 254 представителей компаний управленческих позиций. Результатом являются выявленные различия с результатами аналогичного исследования среди финских компаний, особенности подхода к восприятию практик управления знаниями в российских компаниях, а также скорректированные шкалы для оценки влияния управления знаниями на инновационную активность российских компаний.
Ключевые слова	Практики управления знаниями, показатели деятельности компании, инновации, стратегия, управление человеческими ресурсами, информационные технологии, обмен знаниями, российские компании

ABSTRACT

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Master Thesis Title:	The role of knowledge management processes in innovation performance: the evidence from russian companies
Faculty:	Graduate School of Management (Saint Petersburg State University)
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Year:	2018
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Description of the goal, tasks, and main results:	In Knowledge Management (KM) there is still no agreement about how exactly it impacts business performance. Researchers all around the world proposed many methods of KM evaluation during its 22-year history. The main opinion nowadays is that the impact exists, it is mostly indirect, and it can be measured through evaluation of mediators' effect. The goal of this research is to define the current state of KM in Russian companies and provide an evidence of the impact of KM on innovation performance through systematic managerial activities. This approach is the most contemporary and was described and tested in Top Italian (Daniele Giampaoli, Massimo Ciambotti, & Nick Bontis, 2017) and Finnish firms (Inkinen, Kianto, and Vanhala 2015). By means of an online survey, the current state of Knowledge Management in Russia has been recorded. Comparison with Finnish enterprises has shown a significant difference in the impact of managerial activities on innovation performance. Adjusted measurement scales have been proposed and constrains about Russian peculiarities in knowledge management have been identified. Further comparison with the previous state and other foreign enterprises is also possible.
Keywords:	Knowledge management practices, Organization performance, Innovation performance, Strategy, Human resources management, Information technology, knowledge sharing, Russian companies

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INTRODUCTION

Knowledge Management (KM) is relatively new but already developed field of science. However, there is still no agreement among scholars on “how exactly KM impacts business performance?” “During examining the existing academic literature on the topic, one can easily notice the relative shortage of empirical studies about an actual connection between KM and organizational performance. Without clearly demonstrated benefits, why should companies keep on investing in KM?”(Tatiana Andreeva & Aino Kianto, 2012) The main opinion nowadays tells us that the impact exists, it is mostly indirect, and it can be measured. Thus, there is a need to apply most recent performance measurement system to local companies to provide a benchmarking opportunity to Russian companies.

This research is based on the framework suggested by Inkinen Kianto in the article “Knowledge Management Practices and Innovation Performance in Finland" (Inkinen, Kianto, and Vanhala 2015). She argues that Knowledge Management and Innovation are continuous processes and, thus, should be tracked and measured accordingly. The novelty of this approach is in the focusing on dynamic and proactive management activities, how they are supported by KM, and which impact they have on innovation performance. In other words, the impact of KM on innovation performance is measured through conscious and systematic managerial activities like recruitment and compensation practices. Although this approach might look as a minor deviation from previous studies, it could significantly enrich the current understanding of how KM impacts firm performance.

Another purpose of this research is to track the state of KM practices development in Russian Firms. There is not too much evidence for the Russian area how these practices are accepted and implemented. The existing studies focus on narrower aspects of KM, or already irrelevant (data collected in 2014).

The results of this study will contribute to the overall understanding of knowledge management process performance, specifically, its impact on innovation performance in Russian companies. Local test of the contemporary framework of measurement of this effect is important not only from the academic point of view – businesses could get new inside, benchmark and guideline on how to improve innovation performance or how to ground development of knowledge management practices in the company.

1. KNOWLEDGE MANAGEMENT THEORETICAL BACKGROUND

1.1 Introduction to KM

Knowledge management as a science field was born in 1995 with the publication of the article Nonaka, I.A., and Takeuchi, H.A., "The Knowledge-Creating Company: How Japanese Companies Create the Dynamics of Innovation" (Nonaka & Takeuchi, 1995). The article was innovative, and, since this moment, activities of handling the knowledge have their own field. A number of articles are still growing, and not too many companies are aware of KM practices.

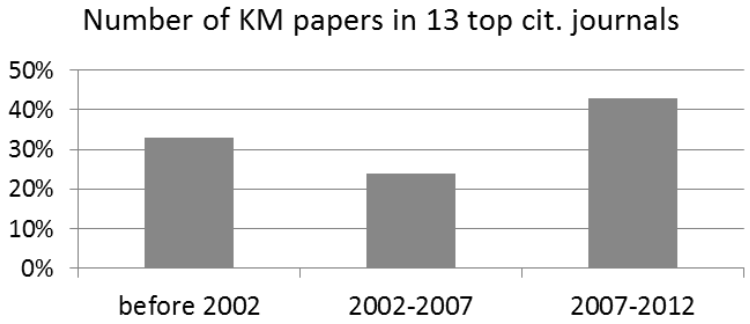

Figure 1. KM papers count.

"The subsequent growing interest in Knowledge Management has resulted in an exponential growth in KM publications over the last decade at a rate of almost 50 percent per year" (Mohamed A.F. Ragab & Amr Arisha, 2013)

But there is still no agreed definition of KM among researchers (Heisig, 2009), so it is better to introduce the overlapping areas from other disciplines:

Figure 2. KM areas (Mohamed A.F. Ragab & Amr Arisha, 2013).

The five overlapping areas are the main research directions in KM, according to Ragab & Arisha. In this literature review, we wouldn't refer to human resources and Information Technology areas. The focus will be on the evaluation of KM performance, with some links to materials regarding accounting and philosophy areas.

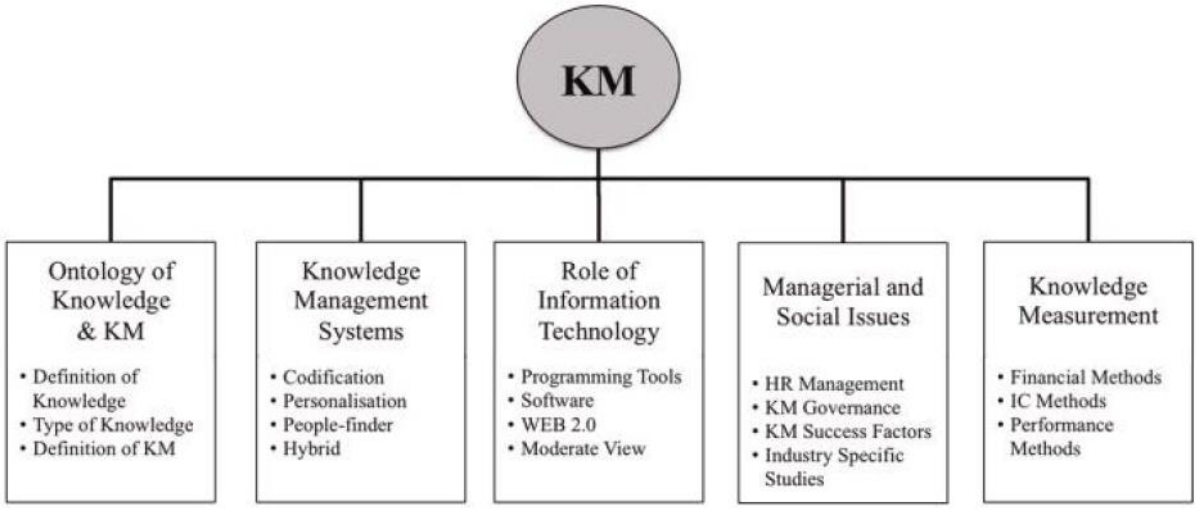

Figure 3. KM Literature map (Mohamed A.F. Ragab & Amr Arisha, 2013)

The definition we would like to use in the further research was given in 1998 by O'Dell "KM is a conscious strategy of getting the right knowledge to the right people at the right time…" (O'Dell & Grayson, 1998). These three pillars underline the need of recognizing helpful information among the tremendous measure of data that a company delivers day by day. Knowledge is required each time we search for an answer or making a decision. Information creates financial esteem when it is used to take care of issues, investigating new open doors and decision making. Thus it is a problem solving that will enhance the comprehension of its condition and increment its absorptive capacity.

The last part about time was usually missing in the KM evaluation articles worldwide because KM is a quite difficult matter to measure even regardless time dimension. One of the recent publications covers this gap: Giampaoli, "Knowledge management, problem solving and performance in top Italian firms" (Daniele Giampaoli et al., 2017), on which this study is based.

1.2 History of the KM performance measurement research question

There were many studies on this question. Now we will try to track the evolution of the KM performance measurement model from the simplest to the most complex.

The object of measurement

Some studies have begun with the simplest assumption: the more knowledge the company has, the better it is performing (Liebowitz & Wright, 1999). It seems to be obviously wrong, but actually, the scientific discussion has led us to the whole area of research regarding knowledge

philosophy. For a quite long time there was no agreement on the subject of knowledge – could a company "own" knowledge, generate it, share, sell buy? If yes, how could be knowledge separated from a human? These are questions on the edge of philosophy.

So, the business distinguishes organizational and individual (or personal) level of knowledge management. All recent studies rely on the assumption that organization could manipulate knowledge (Gopika Kannan & Wilfried G. Aulbur, 2004). However, according to the classic work of (Nonaka & Takeuchi, 1995), only individuals are capable of creation, codification and sharing knowledge. So, to our opinion, individual level is highly underestimated among researchers nowadays.

The dichotomy of organizational/individual knowledge is very important for this study. The other one is also closely related to the philosophy – tacit vs. explicit knowledge. A firm could accumulate knowledge in two forms – as some physical matter (information written on paper, hard drives or servers) or as people (good teacher, gifted manager, excellent mentor). The competence of people measurement is positioned in HR department, so there was a birth point of another KM area: "knowledge workers management". And Nonaka has given hints on conversion of knowledge types in his work:

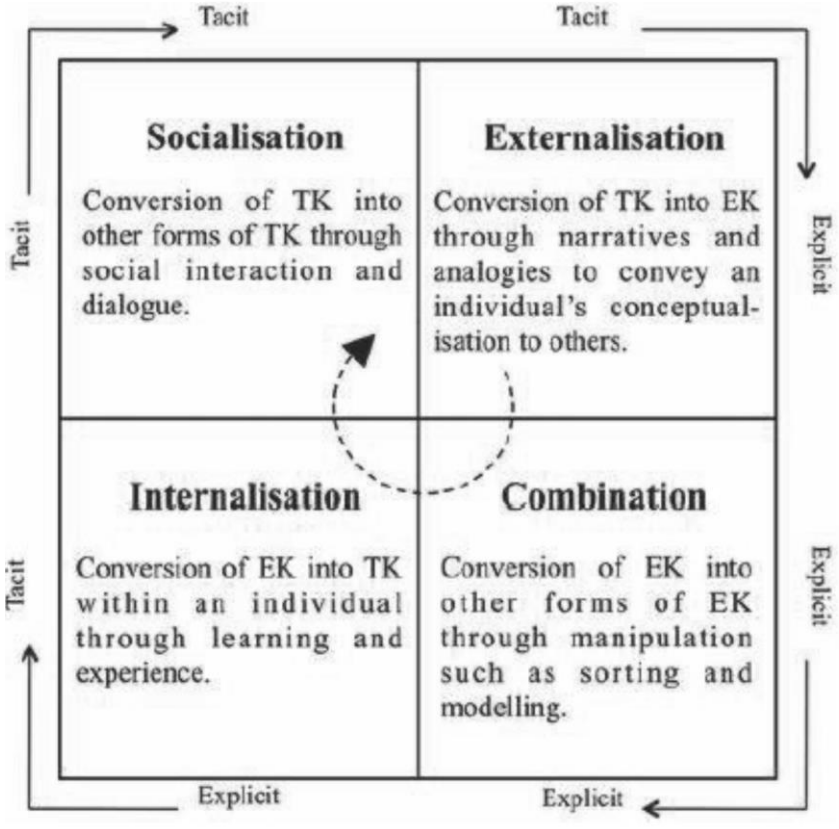

Figure 4. KM types conversion processes (Nonaka & Takeuchi, 1995)

Today's associations are seen as "wellsprings of learning" (Leonard, 1995) and therefore can't bear to lose time "rehashing the wheel" (Dani et al., 2006) or searching for old information

they can't recover by attempting to "recognize what they know" (Sieloff, 1999). Such learning misfortunes, which can have impending outcomes for any association, can happen accordingly of numerous inward and outer components, for example, layoffs, acquiescences, retirements, rebuilding and outsourcing (Delen and Al-Hawamdeh, 2009). At the point when workers leave the company, they are probably going to bring with them forever years of experience and significant learning that could be extremely valuable to their associations (Du Plessis, 2005; Hofer-Alfeis, 2008). Endeavoring a valuation, a US Fortune-500 organization assessed the loss of just a single experienced promoting director to surpass $1 million because of the loss of knowledge.

“To overcome these barriers and change human behavior, in-depth research has been conducted in the area of overlap between KM and Human Resources Management (HRM). Based on the fact that ‘‘people’’ are the main drivers of KM (Yahya and Goh, 2002), research in this area studies HRM functions from a KM perspective. In the case of motivation, for example, studies focus on how to encourage employees to share their knowledge (Vilma and Jussi, 2012) and engage with KM initiatives (Sie´ and Yakhlef, 2009; Swift et al., 2010). The dominant view is that employees do not share their knowledge for nothing and that knowledge is transferred through transactions that take place in a ‘‘knowledge market’’ in which there are buyers and sellers (Barachini, 2009).”(Mohamed A.F. Ragab & Amr Arisha, 2013)

So, still, how could we measure the amount of knowledge in the firm? There is no particular answer to this question in KM. If we conduct a deep analysis in this field, it will be an article on philosophy or even neuroscience work. It is noteworthy that much earlier humans were trying to study knowledge flows inside companies from creativeness perspective. There were a lot of articles in the 1980s on this topic. However, they haven’t managed to overcome the problem of measurement immeasurable.

Recently researchers finally found the way around this problem. Instead of measurement of such intangible thing as knowledge, skills, information, we could address the question “how does a presence of such thing as knowledge in company impact its performance?” (Carrillo, Robinson, Anumba, & Al-Ghassani, 2003). Among the competition of methods, many opinions have been argued. Here are some of them:

- Investments in KM not necessarily bring a better performance (Bogner & Bansal, 2007) (Kulkarni, Ravindran, & Freeze, 2006)
- Value of KM exist, but we are unable to measure it (Ibrahim & Reid, 2009)
- To truly understand and measure the impact, we should study both knowledge and its management in the company (Mu-Jung Huang, Mu-Yen Chen, & Kaili Yieh, 2007)

After many publications, researchers have agreed that knowledge and KM should be distinguished. That value of KM exists, and we can find ways to measure it.

A business tool

The next question was from the business side: if KM impact is measurable, what is the metrics? The researchers successfully separated object (individual) level from management (macro) level, collected all data on KM activities into “knowledge management infrastructure” (KMI) and started to research KMI impact on firm performance.

“Likewise, a distinction can be made between knowledge procedures and knowledge management practices. The principal alludes to the learning forms that actually exist in a business (e.g. information sharing or learning securing), and last ones to that administration hone which bolster the proficient and successful administration of information for hierarchical advantage. Learning procedures are out of direct administrative control and in this way their review depicts information based photo of an association, however, does not expressly educate authoritative chiefs about potential answers for enhancing them. Subsequently, a reasonable working definition of the present paper is that KM comprises of an arrangement of administration exercises that empower the firm to convey an incentive from its learning resources.”(Mohamed A.F. Ragab & Amr Arisha, 2013)

KMI includes mostly tools, practices, and pieces of software related to knowledge management in the company. The object level refers to KM processes, such as creation, codification, transfer, evaluation of knowledge.

We would rather call this step “business intervention to science” because the rejection of studying KM processes impact is related mostly to an inability to manipulate with such processes. It is impossible to “apply or implement knowledge creation” in a firm. Instead, a manager could introduce after action review, for example. The last tool is “more tangible”, impact on firm performance is measurable via before/after technique. That was exactly what business had demanded, and research has started.

There are articles, in which impact on different aspects of firm performance was studied:

- Product leadership (Zack, McKeen, & Singh, 2009)
- Operational excellence (Zack et al., 2009)
- Customer intimacy (Zack et al., 2009)
- Innovation (Darroch, 2005) (Tatiana Andreeva & Aino Kianto, 2012)
- Organization creativity (Sangjae Lee, Byung Gon Kim, & Hoyal Kim, 2012)
- Competitive advantage (Shu-Hui Chuang, 2004)
- Financial performance
    - Positive impact (Tanriverdi, 2005) (Tatiana Andreeva & Aino Kianto, 2012)
    - Negative impact (Kalling, 2003)

Moreover, KM infrastructure was also divided into subdivisions and studied separately. “There seem to be two main sets of such practices widely used in many big companies: one related to information technology and computer-supported communication, and the other related to human resource management. For example, according to Bhatt (2001), both technological and social frameworks are essential in KM and it is the cooperation between these that empowers overseeing learning successfully. Additionally, as indicated by Hansen et al. (1999) the principle KM practices are connected with data innovation and HRM (contracting, preparing, fulfilling). Both of these figures in codification and personalization strategies, however with various focus. In codification technique, data innovation is intensely put resources into and its objective is to connect individuals with reusable codified knowledge. Individuals are compensated for utilizing and adding to report databases. In personalization system, the objective of data innovation is to encourage discussions and trade of implied information and individuals are compensated for straightforwardly imparting learning to others. It is noteworthy that the present examination is not centered on each conceivable Information Communication Technology or Human Resource Management practice but only those that are explicitly aimed to support knowledge processes in an organization. The following sections examine these practices in more detail.”(Mohamed A.F. Ragab & Amr Arisha, 2013)

Here are two separate areas on which authors have split KMI: (Tatiana Andreeva & Aino Kianto, 2012)

- Human resources management area of KM
- Information and communication technology area of KM

One more quotation of their work will explain two issues of doing research in KM evaluation area:

“Despite the growing evidence of KM’s contribution to organizational performance, there are several issues that still have not been fully addressed in the existing studies. First, performance has been interpreted and measured very differently across existing studies. Second, most of the studies focus on knowledge processes rather than on knowledge management practices. Though knowledge processes can be stimulated or inhibited by particular management practices, they also naturally exist in any organization irrespectively of managerial efforts. Therefore, studies that only focus on knowledge processes cannot inform managers about solutions that can improve their firm’s performance through better management of knowledge. In line with this argument, the emerging knowledge governance approach highlights the lack of studies of the formal organization from KM perspective and calls for more research in this field.”(Tatiana Andreeva & Aino Kianto, 2012)

Unsurprisingly, the critique of this exploiting approach arisen in the scientific sphere (Foss, Husted, & Michailova, 2010). Researchers argue that a separation of KM processes from KM

infrastructure makes found correlations highly biased and particularly vulnerable to the time lag bias. So, the impact of knowledge sharing process on financial outcomes has been studied (Foss et al., 2010).

Besides the debate between approaches to design a research model for measuring KM impact on firm performance, there are studies on the universality of KM practices. Domenech and Roig-Tierno, 2016, investigated how knowledge-intensive activities differ in 18 European regions. The research is based on Regional Innovation Scoreboard 2014, published by EU, which traces such characteristics of regions, as Availability of highly skilled workers, R&D expenditure, Collaboration with other agents, and Patent applications. Domenech and Roig-Tierno found that both public and private R&D spending are drivers for innovation in a region, however, their effectiveness heavily relies on region's absorptive capacity – a characteristic, which depends on firms' willingness to cooperate and share results as well as the overall percentage of employees with a higher degree. In other words, cultural dimensions could have an impact on the effectiveness of managerial effort towards boosting company's innovation performance.

Investigation of knowledge management in Russian context is also done regularly (Puffer and McCarthy, 2011). Overall maturity of this field of study is assessed as "passing through a forming stage", or even dysfunctional (May and Stewarl 2013), and Russian innovative developments – as "limited base for the successful implementation of technological changes in firms" (Shirokova and Bystrova, 2014). One of the main focus of studies here is knowledge sharing process. It is a KM activity, which enables further development of knowledge economy. However, in Russia, it is constrained with cultural reasons, such as distrust for formal organizations and, thus, heavy dependency on informal institutions such as culture and ethics (May and Stewarl 2013).

1.3 Recent research

The contemporary analysis is focused on the further complication of this model. We would like to specifically cover the empirical study on KM practices in the different cultural environment (Andreeva & Kianto, 2012), a study on KM impact on innovation performance (Inkinen and Vanhala 2015), and an article about finding a bridge between KM and firm performance in another mediator (Giampaoli et al., 2017). The overall summary of them is that KM has an impact on performance but researchers do not agree on whether it is direct or indirect. So they try to find hidden variables, mediators, and autocorrelations.

The idea that an impact of knowledge management on innovation performance exist is not new, but the positive relationship has been supported empirically only a few years ago (Ciabuschi

and Martín 2012, Andreeva and Kianto 2011). Thus, there is no agreement between researchers on the universal framework and measurement scale for this type of study yet.

Inkinen Kianto argues that Knowledge Management and Innovation are continuous processes and, thus, should be tracked and measured accordingly (Inkinen and Vanhala 2015). The novelty of this approach is in the focusing on dynamic and proactive management activities, how they are supported by KM, and which impact they have on innovation performance. In other words, impact of KM on innovation performance is measured through conscious and systematic managerial activities like recruitment and compensation practices. Although this approach might look as a minor deviation, empirical findings contributed a lot to the current understanding of how KM impacts firm performance. Inkinen Kianto develop new scales to measure impact, based on effects, previous studies suggested. They are: Supervisory work, Knowledge protection, Strategic KM, Knowledge-based recruitment, Training and development, Assessment of employees, Knowledge-based rewards, Learning mechanisms, IT practices, and Work organization.

Giampaoli argues that KM has an indirect impact on organizational results and one of the mediators is a decision-making process (or problem-solving process – he equalizes these terms). He has conducted a survey to measure an impact of KM on decision making speed and creativity (Giampaoli et al., 2017). This approach was unique and extended previous research, which had in focus IT and HRM practices (Andreeva & Kianto, 2012), business process capabilities and knowledge assets (Ing-Long Wu & Jian-Liang Chen, 2014).

It is noteworthy to mention a study, which focused not on impact measurement design, but rather on cultural differences in KM. It is generally agreed that knowledge management practices are universal. But an empirical study conducted by Henri Hussinki suggests that managerial assessment of value-creating KM practices might vary among different countries. By means of a structured survey, he collected a cross-country multi-firm dataset during 2013-2014 (Hussinki et al. 2017). Comparison of Finland, China, Spain, and Russia has been made by applying the conceptual model from Inkinen and Vanhala 2015. Results show an evidence of variance between differences cultures, which proves the necessity of further research in this field.

1.4 Research problem, field, topic and questions

Having described recent developments of theory in knowledge management impact on innovation performance, we formulate a knowledge gap, which we cover in our research.

The most recent research about KM practices impact on firm innovation performance has been published in 2017 but was based on data collected in 2014 (Hussinki et al. 2017). It utilized a conceptual framework from Inkinen and Vanhala 2015 to highlight cross-cultural differences between Finland, China, Spain, and Russia. The result is an evidence of variance of KM

performance assessment, but no specific recommendations for the model adjustments were given, as well as no measurement of the KM impact on innovation performance has been done. Moreover, the dataset of Russian companies was the smallest (83 out of 633 total). Also, Russian environment changed a lot since 2014 – besides from macroeconomic and geopolitical events, IT infrastructure and entrepreneurship environment have advanced significantly to impact KM practices in the country in general (Avdeeva 2017). In other words, some new steps towards knowledge economy in Russia have been made. Finally, recent theoretical developments suggest to study KM related terms in different cultural contexts (Domenech, and Roig-Tierno, 2016, Hussinki et al. 2017), and latest research hasn't considered such KM peculiarities of Russian context as focus on knowledge sharing (Puffer and McCarthy, 2011).

In this paper, we investigate whether KM impact on innovation performance could be measured with existing frameworks and scales in Russian companies, or not, and how the model could be adjusted based on empirical findings and general cultural differences (focus on knowledge sharing and distrust to formal organizations).

To the knowledge of the author, there is no contemporary evidence of the current state of KM impact on innovation performance in Russia, and the most recent research suggests to study deeper regional peculiarities and how KM terms could be adjusted to measure KM in local context.

For the purpose of benchmarking the results, we use available data on developed Finnish economy with developed stage of knowledge management practices (Inkinen and Vanhala 2015).

Thus, research characteristics are defined as follows:

Table 1. Research characteristics: type, problem, gap and main questions.

Field	Knowledge management evaluation
Topic	The role of knowledge management processes in innovation performance: the evidence from Russian companies
Type	Application of a framework to measure the locally current state of phenomena
Problem	How to measure the impact of KM on innovation performance in Russia?
Research gap	There is an evidence, that both Russian environment for KM and KM theory base have changed, and no contemporary evidence of the relation between KM and innovation performance from Russian companies.
Questions	1. What are the main peculiarities of the link between KM and innovation in Russian companies, as in forming knowledge economy? 2. Through which business processes KM has the biggest impact on innovation performance in Russian companies? 3. How different is relationship between KM practices and innovation performance in Russian firms in comparison with Finnish ones? 4. Is the most contemporary approach meaningful in Russian context, and how could it be adjusted to consider local peculiarities?

2. RESEARCH METHODOLOGY

2.1 Methodology

Importance

Existing studies proved that generally impact of the KM is the positive, and indirect effect is higher than direct. Also, Knowledge Management infrastructure has more influence on non-economic business performance indexes that on monetary factors.

There is little evidence for the Russian companies how much KM impacts company performance. So, the first contribution of this study is to gather information about current state of KM practices usage in the companies. We will focus on measuring one specific firm performance segment – innovation performance, as not only business but also Russian government, put emphasis on it. The second purpose is to apply contemporary framework and measurement scale for KM and to test if they fit Russian business. This will open an opportunity for future research to compare measurement scales and benchmark KM efficiency with the foreign colleagues. The existing studies focus on narrower aspects of KM or have already irrelevant data in their basis – data from Russian companies is collected in 2014 (Hussinki et al. 2017).

Data requirements

The primary data source for this research is executives of Russian companies, people, who have access to both information on firm innovation performance and are involved in knowledge management.

Secondary data sources are findings of previous research, in which data has been collected among different companies, in different countries or earlier than 4 years ago.

Research Design

The decision was made to focus this research on practices

the framework suggested by Inkinen Kianto in the article “Knowledge Management Practices and Innovation Performance in Finland" (Inkinen, Kianto, and Vanhala 2015). They argue that Knowledge Management and Innovation are continuous processes and, thus, should be tracked and measured accordingly. The novelty of this approach is in the focusing on dynamic and proactive management activities, how they are supported by KM, and which impact they have on innovation performance. In other words, the impact of KM on innovation performance is measured through conscious and systematic managerial activities like recruitment and compensation practices.

Mohamed A.F. Ragab has shown that the most commonly used instruments to measure KM’s impact on performance usually are questionnaires, surveys or interviews. (Mohamed A.F.

Ragab & Amr Arisha, 2013). Thus, measurement KM performance depends on a respondent's subjective perception of the topic, and one of the most important instruments for analyzing its impact is structural equation modeling (Andreeva and Kianto, 2012).

We measure the current state of existing phenomena, and testing how existing framework will fit the local concept. Hence, the research design could be called a "Theory-testing" in Jarvinen methodology. We have chosen a survey as the main method for primary data collection because it requires less time for interaction between a researcher and a respondent.

So, the type of the research is an empirical study, type of methodology is Behaviourist Research, and the main method will be a survey. The framework is already proven on Italian Firms. Thus, the survey could be held among Russian companies.

Suggested survey structure

We will be using a survey structure that has been proven in several studies, such as Andreeva & Kianto, 2012, Cabrera & Cabrera, 2005, Sangjae Lee et al., 2012, Giampaoli et al., 2017.

Sections (each section will have 2-10 questions):

- General questions: firm size, industry, employees with higher education, etc.
- Strategy
- Supervisory work
- Work design
- Recruitment process
- Employees Performance Appraisal
- Rewards
- Training and Development
- Information and communication technology
- Knowledge protection
- Firm Innovation Performance

2.2 Key sources of data

The data were collected with a web-based survey in Russia. In order to obtain reliable, diverse and comparable data, it was decided to select companies with 100 or more employees. As a first step, the pools of companies that fit into the described above criteria were built based on the publicly available database SKRIN "Enterprises". The size of the initial pool was 1090 companies. Next, the invitation letters explaining the purpose and the procedure of the research and providing the link to the web-based questionnaire were emailed to the selected companies. Respondents were

promised an executive summary report of the research findings as an incentive to complete the survey. In Russia, acknowledging the typical reluctance in the corporate world to participate in any research due to the culture of the information secrecy, it was predicted to have a low response rate of companies – 101 responses (9,3 percent of those who have visited the survey webpage). Taking into account the negative attitudes to this method of data collection in Russia, multiplied by the length of the survey and the novelty of its subject area, this response rate, though being very low, can be considered as good. Further on, to enlarge Russian sample, the invitation to participate in the survey was sent to the members of the alumni club of one of the Russian business schools. This effort yielded a 4.6 percent response rate. In addition, some respondents were also reached through the personal networks of the researcher (with 54 percent response rate). As a result of these efforts, 254 responses were collected.

The survey reached quite well the management level of the targeted organizations: over 80 percent of respondents belonged to middle- or top-management. The rest of the surveyed respondents informed that they hold leading specialist positions in their organizations. While survey questions had been designed in a way that any employee of the organization could answer them, the high share of managerial responses makes the data collected even more insightful. All of the survey items were measured by a six-point semantic differential scale, in order to avoid central tendency bias in responses, with seventh ‘‘I don’t know’’ option. Survey items were anchored with ‘‘strongly disagree’’ and ‘‘strongly agree’’.

The questionnaire was developed in three phases. In the first one, suitable variables and items were chosen from the literature and used to compose a draft questionnaire. In the second phase, the draft was sent to a full professor of knowledge management and innovation and to three CKOs who agreed to take part in the project. After explaining the aim of the research, each one of them was asked to give an opinion on the adequacy of content and provide clarity to the items. In the third phase, an amendment draft was raised according to their guidelines and once again sent to them for a further feedback. Having only positive feedback after this step, this version became the final one.

3. EMPIRICAL STUDY

3.1 Description of the model

To answer the question "how to measure the impact of KM on innovation performance in Russia?" we follow standard research steps:

1. review existing studies
2. form a hypothesis
3. develop and test a pilot survey
4. adjust questions or hypothesis and conduct the main survey round
5. analyze the data
6. compare findings with existing research
7. form suggestions for a future studies

Differences among firms' performance can be explained by the way knowledge is managed (Massingham and Massingham, 2014). The main idea of the research in the field is that KM has some kind of impact on performance that is proved and tested but researchers and specialists still do not agree whether the impact is direct or mediated by some other variables (Andreeva and Kianto, 2012).

KM practices are defined as the set of management activities conducted in a firm with the aim of improving the effectiveness and efficiency of organizational knowledge resources and refer to the aspects of the organization that can be manipulated and controlled by intentional management activities (Andreeva and Kianto, 2011). We conceptualize them as the set of intentional management activities that enable the company to get the value from its knowledge-based assets. We grounded on the research model of the previous study (Inkinen et al., 2015) that was previously tested on the market of Finland. They have developed a 10 scales model:

Supervisory work. This construct includes overall leadership and managerial effort to establish an innovative corporate culture in a company.

Knowledge protection. Firms, which understands the value of corporate data and knowledge are more likely to care about building a competitive advantage of the company around knowledge. Both tangible and intangible knowledge protection, as well as formal and informal protection mechanisms, are considered.

Strategic KM. Knowledge assets are also valuable for the company. Those, who understand this, consider such assets during strategy creation, planning, and adjusting. A strategy, based on knowledge, includes monitoring and communication needs of developing these assets.

Knowledge-based recruitment, Training, and development, Assessment of employees and rewards. HRM practices, in general, have a significant impact on KM. Thus, consideration

of knowledgeability of employees, the introduction of knowledge sharing activities with decent participation motivation schemes, etc. are beneficial for the company, which aims at boosting their innovation performance.

Learning mechanisms. These constructs represent top-down knowledge sharing techniques. With the more accessible and transparent mechanisms of knowledge transfer from experts and supervisors to the less knowledgeable employees, a firm will experience better performance in general.

IT practices. Knowledge management infrastructure is an integral part of KM.

Work organization. These practices are related to organizational design, distribution of functions and roles among employees, structure of departments, etc. The better design fits an organization, the less transaction costs it will experience, including information and knowledge sharing "transactions".

Thus, we use the same argumentation, but study the feasibility of the model in the Russian context. Literature suggests 3 main local peculiarities of KM: immaturity of KM practices, importance of knowledge sharing and dependency on informal institutions (Puffer and McCarthy, 2011, May and Stewarl, 2013 and Shirokova and Bystrova, 2014).

First hypothesis is directly related to 10 constructs, described in Inkinen et al., 2015:

- *H1: All scales are feasible to measure impact of KM on innovation performance in Russian context*

Next 4 hypothesis are aimed to test feasibility of the model to represent local peculiarities. First, we form a question about overall impact of a corresponding construct in the original model, and then we will test how constructs themselves are feasible to represent a phenomena.

- *H2: Knowledge sharing has significant a positive impact on firm's innovation performance through "learning mechanisms" construct.*
- *H3: Construct "learning mechanisms" is feasible to represent knowledge sharing practices impact on innovation performance*
- *H4: Dependency on informal institutions has significant a positive impact on firm's innovation performance through "work organization" construct.*
- *H5: Construct "work organization" is feasible to represent the impact of dependency on informal institutions on innovation performance*

To test this hypothesis, we developed a structured survey of total 55 questions. All questions were divided into two main groups: general questions about respondent (9 questions) and questions about the subject of the study (46 question – they are presented in Appendix 1). We used 6-grade Likert scale to avoid neutral answers. We tested it among potential respondents. They understood the questions correctly and shown a valid result, so we proceed further.

Companies were selected for analysis using the SKRIN “Enterprises” database (more than 100 employees, the presence of R&D department), email dispatch with an invitation to fill in the survey was made and the result was formed by 254 companies (out of 1090 - response rate 23%). The respondents represented the high/mid-managerial level (head of the company/head of the department/leading specialist of the subdivision) and filled in the survey based on their perception. Data collection proceeded from September to December 2017.

After data collection step we check the validity of received answers, transform data if necessary and run the analysis. The main method of the measurement of effect, which independent variables have on dependent ones, is a partial least squares path modeling. This method allows estimating complex cause-effect variables relationship while maximizing variance explained.

As a result, our findings are comparable with the ones from research among Finnish companies. This enables opportunities to test the applicability of the whole approach to the Russian context and to stress the reliability of the new model itself. In our research, we focus on the first part – looking for the peculiarities of measuring knowledge management and innovativeness in Russia, and suggest adjustments to the scales used in the research.

Thus, the next step in our research model is to list the differences and similarities of data among Finnish and Russian companies. Then we run a confirmatory factor analysis to check data for any latent variables, form and interpret new constructs, and define new hypothesis on the reliability of these new constructs.

On the last stage of the research, we form constrains on constructs usage and make a conclusion on the applicability of the model to the Russian context.

3.2 Analysis

The process of data analysis consists of following general steps: an exploration of characteristics of variables, data preparation (a dataset should meet analysis methods requirements), running the data analyzing tools, interpretation of the results (whether to reject hypothesis or not). In this research, it is not different. Each step of this process is described below, with the highlights of key findings.

Descriptive analysis

There are 55 questions in a survey and 254 answers collected. All questions could be divided into two main groups: general questions about respondent (9 questions) and questions about the subject of the study (46 question). First, we analyze the second group of questions, to have a glimpse of how valid collected data is.

There were 3 incomplete responses (1,2%). That is a quite low part, so we decided to exclude them from the analysis instead of filling in missing values.

First, descriptive statistics were built question wise. This step allows us to check data validity and identify needed data transformations for further application of methods. We check the variables distributions, their means, and standard deviations, analyze data diversity and highlight outstanding results.

In our survey, we used a 6-grade Likert scale to avoid neutral answers. A full table of question labels, mean, and standard deviation of questions is attached as Appendix 1. In general, answers are quite diverse. Standard deviation is in range of 1,30 – 1,70. Mean is in range of 3,74 – 4,33, which is quite high for 6-grade scale. The frequency of grades used is presented in figure 5.

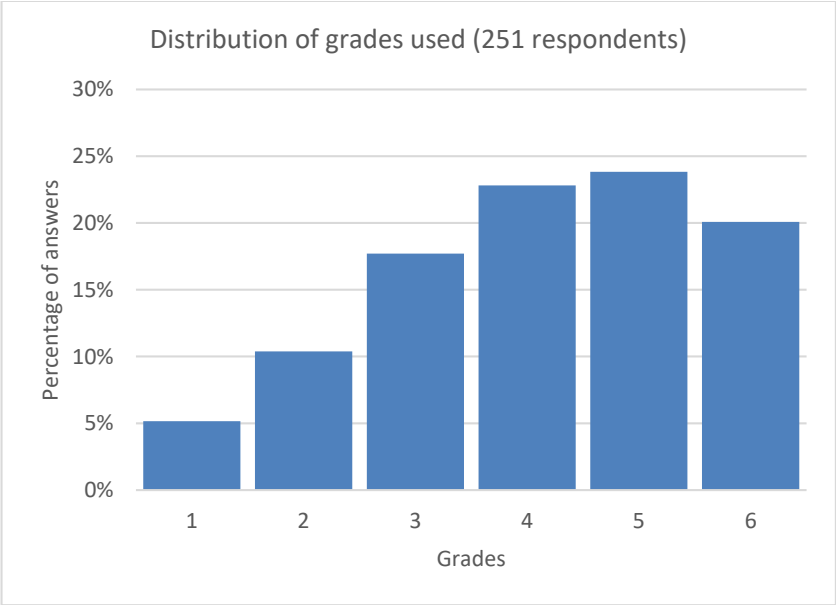

Figure 5. Distribution of total grades used

We have got the lowest answer mean in the question "Supervisors encourage employees to question existing knowledge" ("Руководители поощряют сотрудников сомневаться в существующих знаниях") Mean = 3,74 SD = 1,52. The highest mean – "Knowledge is transferred from experienced to inexperienced employees through mentoring, apprenticeship, and job orientation" ("Знания передаются от опытных сотрудников к менее опытным через менторство/наставничество, обучение, профильные ориентации") Mean = 4,33 SD = 1,34.

The lowest SD – "Technology is utilized to develop new products and services, and new ideas about workflow" ("Информационные технологии используются в компании, чтобы развивать новые продукты и сервисы, а также новые идеи о рабочих процессах") Mean = 4,29 SD = 1,30, The highest SD – Compared to its competitors, how successfully has your company managed to create innovations in products and services for customers area over the past year" ("В сравнении с конкурентами, насколько Ваша компания преуспела в области создания инноваций в области товаров и услуг для потребителей за последний год?") Mean = 3,78 SD = 1,70. The distribution of answers to this question is displayed on the figure 6.

This variable has two local peaks (grades 1 and 5), and visual analysis tell us that distribution is not bell-shaped. Thus, we conclude, that some of the variables don't have a normal distribution. We should prepare data in case we would use methods, which require normality of variables

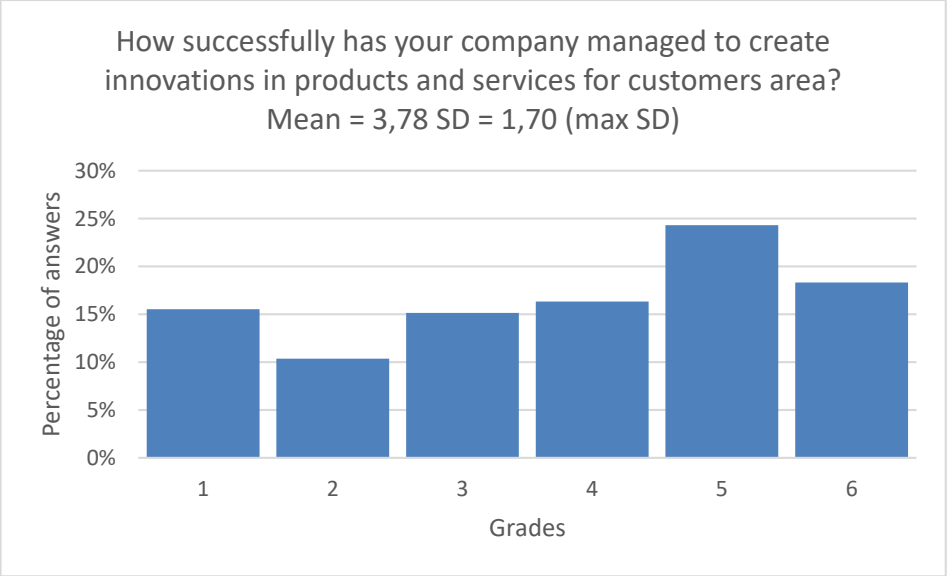

Figure 6. Answers to the question with the most standard deviation

Second, we analyzed answers respondent wise. This step provides us information on respondent diversity and their attitude towards survey. We check a number of scale grades used, their range and distribution to make a conclusion about respondents' styles of filling in the survey.

First of all, we built a distribution of grades for each survey participant. We didn't expect them to be similar, but the results were extremely diverse. On figure 7, one could see answers of three different respondents.

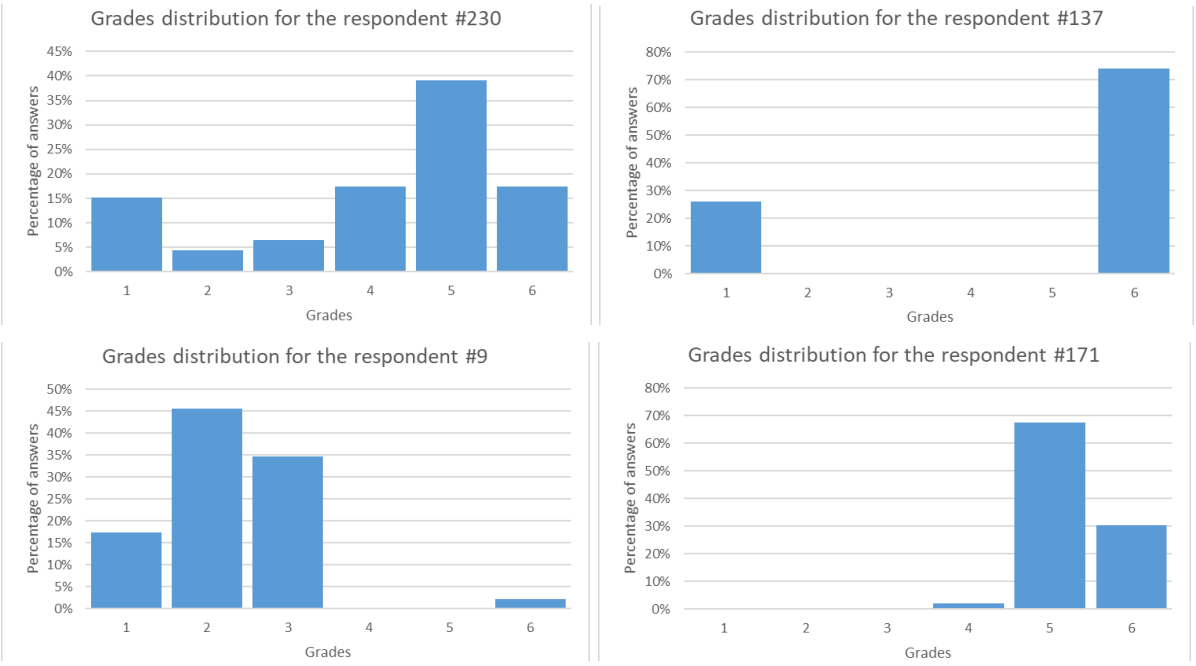

Figure 7. Variety of the grades distribution among respondents

Top two charts demonstrate the problem of extreme or equal distribution of grades when the bottom two illustrate the pessimistic-optimistic answering styles. The most damaging type for the quality of data is the “extreme answering” style (top right chart). When respondent uses few grades from the scale, and treat them as yes/no answers, response becomes barely comparable with other data.

Overall number of participants by grades used could be seen on Figure 8. Most of the respondents used 4 scales or more, but still a significant part of them used 3 or even 2 grades.

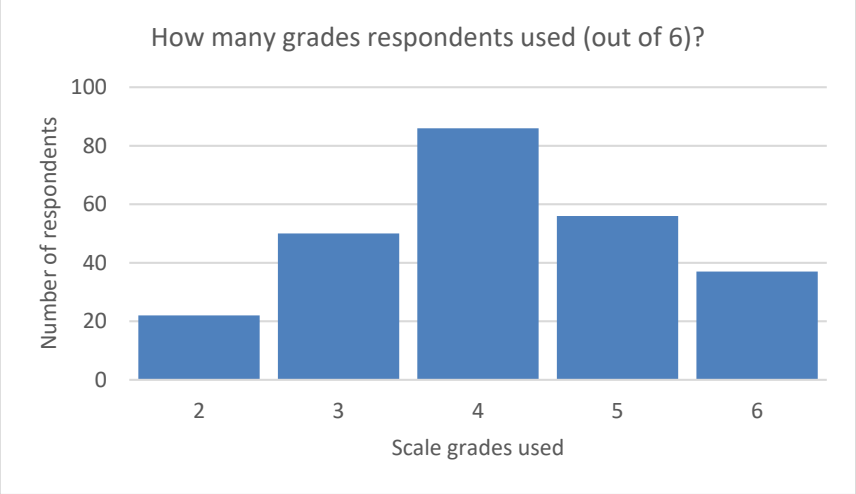

Figure 8. Count of respondents by a number of different grades used.

Respondents overview is presented on Figure 9 and Figure 10. 75% of all respondents are from Construction, Retail, B2B production and Logistics industries. 39% of companies are medium sized, and surprisingly 4 companies stated, that they have less than 100 employees.

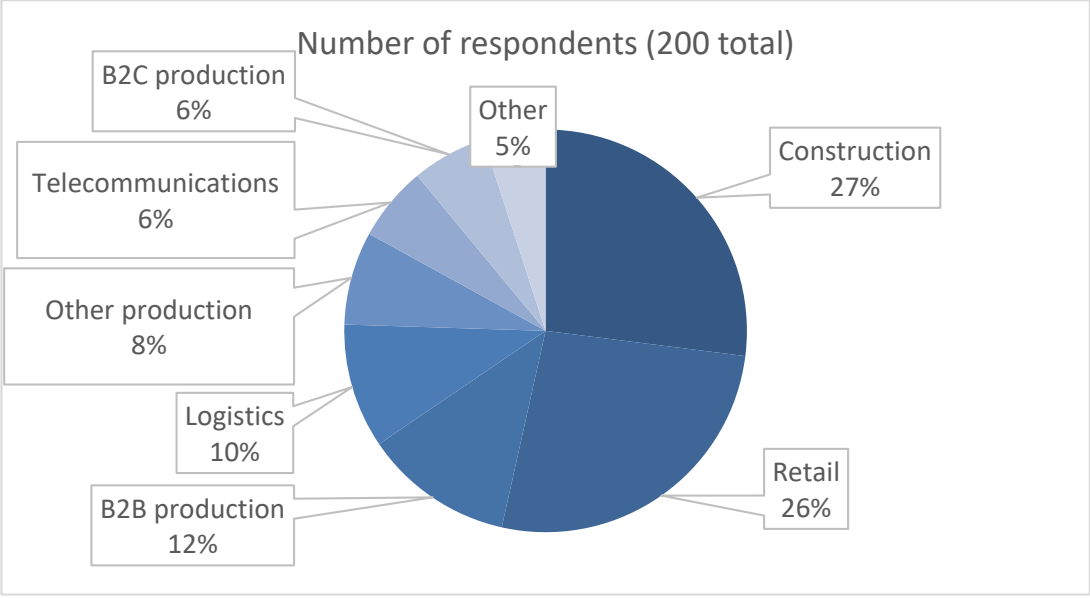

Figure 9. A number of participants by company industry.

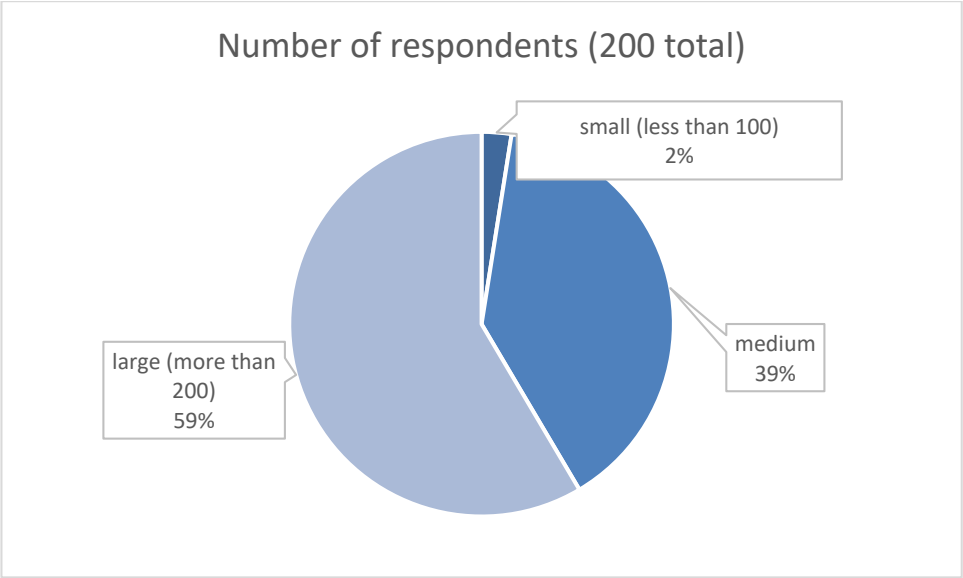

Figure 10. Count of respondents by company size.

Preparation of data

We removed off the ceiling and floor effects (Blair and Imai, 2012) and frequency concentration of one answer > 80% (Hair et al, 2011) and as a result focused on 200 respondents' answers. In total, following steps were made to clear the data:

- Remove incomplete response (1,2%)
- Remove responses with 2 out of 6 grades used
- Remove responses, who used one grade in more than 80% cases
- Remove responses with extreme responses (number of answers with 1 and 6 grade is more than all other responses)

As a result, we excluded 54 respondents (21%) and 200 complete filtered answers left.

Also, we form a new variable for company size. To make data comparable with other countries, we used a scale suggested by European Bank for Reconstruction and Development (EBRD):

- Small companies are those with less than 100 employees (4 total)
- Medium companies are those with between 100 and 500 employees count (98 total)
- Big companies are those with more than 500 employees (118 total)

We keep in mind that we use Partial Least Squares Path modelling further. Algorithm consists of two models: measurement and structural. The first model serves to define the relations between latent variables and directly measured variables - in other words, to form constructs. Structural model measures the effects between latent variables. So, first, we need to define the constructs and check whether they are reliable and valid. In our research, we will use both methods

of doing it – manual and automatic. In the manual approach we keep the original interpretation and use scales, developed by Inkinen and Vanhala:

"We measured KM practices using primarily scales that we developed. We created the supervisory work scale, the training and development scale, and the work organization scale. We created the learning mechanisms scale based upon inspiration from Becerra-Fernandez and Sabherwal (2001). We drew additional inspiration from the literature for the following scales: the strategic KM scale (inspired by McKeen et al., 2005; Kianto et al., 2014; Boumarafi and Jabnoun, 2008), the recruitment scale (inspired by Yanga and Linb, 2009; Cabello-Medina et al., 2011), the performance appraisal scale (inspired by Andreeva and Kianto, 2012), the compensation scale (inspired by Andreeva and Kianto, 2012), and the IT practices scale (inspired by Handzic, 2011; Negash, 2004; Pirttimäki, 2007). We adopted the remaining scale, the knowledge protection scale, from Levin et al. (1987), Cohen et al. (2000), Hurmelinna-Laukkanen and Puumalainen (2007), Hurmelinna-Laukkanen and Ritala (2012), and Lawson et al. (2012)" (Inkinen and Vanhala 2015).

The automatic approach provides completely new, more consistent constructs based on a correlation and factor analysis with the cost of interpretation loss. We will use it to analyze the fitness of scales, suggested by Inkinen and Vanhala, to the knowledge management process impact on innovation performance in Russian context.

So we build construct and suggested in the Finnish research and analyze their validity.

Validity

All indicators in this subsection are calculated using SPSS and MS Excel software.

Construct reliability and validity. Composite reliability and Average variance explained was used to prove to construct reliability and validity. According to the reliability test scenario, AVE should be higher than 0,5, and CR – higher than 0,7 to pass the test. These conditions are held for each of the constructs.

Table 2. Construct reliability and validity.

Construct	AVE	CR
DV Innovation Performance	0,50	0,83
IV1 Supervisor work	0,65	0,86
IV2 Knowledge protection	0,60	0,82
IV3 Strategic KM	0,58	0,85
IV4 Knowledge-based recruitment	0,66	0,85
IV5 Training and development	0,57	0,84
IV6 Assessment of employees	0,65	0,85
IV7 Knowledge-based rewards	0,63	0,84
IV8 Learning mechanisms	0,69	0,87
IV9 IT practices	0,57	0,89
IV10 Work organization	0,50	0,83

Discriminant validity. To check the validity of discriminant Fornell-Larcker Criterion is used. Average variance explained should be higher than the squared correlation of the construct with each other.

Table 3. Construct discriminant validity. Matrix of squared correlations (AVE in diagonal line).

Construct	DV	IV1	IV2	IV3	IV4	IV5	IV6	IV7	IV8	IV9	IV10
DV Innovation Performance	**0,50**										
IV1 Supervisor work	0,16	**0,65**									
IV2 Knowledge protection	0,12	0,27	**0,60**								
IV3 Strategic KM	0,18	0,39	0,29	**0,58**							
IV4 Knowledge-based recruitment	0,12	0,38	0,29	0,32	**0,66**						
IV5 Training and development	0,10	0,33	0,29	0,28	0,39	**0,57**					
IV6 Assessment of employees	0,10	0,37	0,30	0,23	0,41	0,38	**0,65**				
IV7 Knowledge-based rewards	0,09	0,22	0,31	0,23	0,25	0,39	0,32	**0,63**			
IV8 Learning mechanisms	0,15	0,40	0,28	0,30	0,31	0,28	0,31	0,23	**0,69**		
IV9 IT practices	0,12	0,36	0,43	0,37	0,37	0,40	0,34	0,34	0,32	**0,57**	
IV10 Work organization	0,12	0,42	0,32	0,33	0,35	0,43	0,34	0,37	0,35	0,35	**0,50**

Reliability. Companies were selected for analysis using the SKRIN "Enterprises" database (more than 100 employees, the presence of R&D department). The response rate was 23%. The only concern of reliability of the study is time, as companies usually develop their competences quite rapidly, thus, if a similar research will be conducted in more than 3 years from now, one could get different results.

External validity. Due to the fact that this study focused only on Russian companies, the results can be generalized only for the analyzed country. As the companies were randomly selected for this study it is prominent to outline that the results can be applied to the following market spheres: construction, retail, manufacturing, logistics, and telecommunication. Also, results of this study are applicable to all the companies from the SKRIN list with the same filters: more than 100 employees, the presence of R&D department.

Run of the structural model

For the analysis algorithm we use Partial Least Squares Path Modelling (PLS-PM, or PLS-SEM). It is a specific method of applying structural equation modelling, which relies not on

covariance approach, but rather on component-based estimation. Because of that it allows to fit composite model to data and maximizes variance explained (Hair et al. 2014). All indicators in this subsection are calculated using SmartPLS, SPSS and Excel software.

A structural model has no hidden layers: we measure the effect of 10 constructs plus two mediation variables on innovation performance construct. Parameters are default: iterations limit is 300 and stops criterion is 10^-7. The results could be seen in table 4. First of all, there is only one significant effect – Strategic knowledge management. It is significant on 0,05 level, and it has an impact of 0,21.

Table 4. The effect size of each construct on innovation performance

Effect on innovation performance	Russia 2017		
	Path est.	T- stat	P Value
IV1 Supervisor work	0,13	1,12	*0,27*
IV2 Knowledge protection	0,09	0,90	*0,37*
IV3 Strategic KM	0,21**	2,03	*0,04*
IV4 Knowledge-based recruitment	0,04	0,35	*0,73*
IV5 Training and development	-0,03	0,32	*0,75*
IV6 Assessment of employees	-0,01	0,12	*0,91*
IV7 Knowledge-based rewards	0,02	0,17	*0,87*
IV8 Learning mechanisms	0,13	1,32	*0,19*
IV9 IT practices	0,01	0,06	*0,95*
IV10 Work organization	0,01	0,06	*0,95*
EXT Number of employees	0,09	1,72	*0,11*
EXT Industry	-0,07	0,94	*0,35*
R^2	0,24 (N=200)		

Another important note is that mediation variables are non-significant.

These findings do not support hypothesis H2 (“Knowledge sharing has significant a positive impact on firm’s innovation performance through “learning mechanisms” construct”), and H4 (“Dependency on informal institutions has significant a positive impact on firm’s innovation performance through “work organization” construct”).

The importance of strategic knowledge management is easily explainable. Top management could consider knowledge assets while building and executing the strategy, but due to miscommunications or low trust, they do not share the importance of link between strategy and KM with employees.

As one could see, this model in general is feasible in Russian context, but brings little business value. Thus, on the next stage of our research, we applied confirmatory factor analysis. In other words, we run an algorithm to automatically find new latent variables. Then we reconstruct the interpretations of each variable and compare them to the constructs, suggested by Inkinen and Vanhala 2015. Then PLS path modelling is used to define significance of impact of new variables.

Full output of factor analysis is presented in Appendix 3. Interpretations will be given in the next section.

3.3 Key findings

In table 5, the results of a study among Russian and Finnish companies are presented.

Table 5. Effect comparison between Russian and Finnish companies

Effect on innovation performance	Russia 2017		Finland 2014	
	Path est.	T- stat	Path est.	T- stat
IV1 Supervisor work	0,13	1,12	−0,01	0,10
IV2 Knowledge protection	0,09	0,90	−0,04	0,58
IV3 Strategic KM	0,21**	2,03	0,20*	2,10
IV4 Knowledge-based recruitment	0,04	0,35	−0,13*	1,93
IV5 Training and development	-0,03	0,32	−0,08	1,08
IV6 Assessment of employees	-0,01	0,12	−0,01	0,17
IV7 Knowledge-based rewards	0,02	0,17	0,21*	2,11
IV8 Learning mechanisms	0,13	1,32	−0,11**	1,31
IV9 IT practices	0,01	0,06	0,20*	1,23
IV10 Work organization	0,01	0,06	0,07	0,71
EXT Number of employees	0,09	1,72	−0,02	0,40
EXT Industry	−0,07	0,94	0,05	1,10
R^2	0,24 (N=200)		0,15 (N=259)	

The identical research model makes this data fully comparable. The model fitness is sligtly higher – 0,24 in Russia vs 0,15 in Finland.

Overall, results are not similar. One could see the difference between the number of significant effects, which highlights the immature state of KM in Russia. However, little business value couls be extracted from this model, so on the next step confirmatory factor analysisn results are presented.

Table 6. New constructs and their path estimates

New construct name	Path est.
Supervisory work	n-s
Strategy implementation	+0,22**
Appraisal of the personnel	n-s
Supervisor encouragement of knowledge sharing	+0,13*
Knowledge-based Recruitment	n-s
Information Technology	n-s
Recruitment based on relations	n-s
Learning mechanisms	n-s
Information protection	+0,11*
Knowledge sharing practices	+0,16**
R^2	0,28

One could see that factor analysis distinguished also 10 constructs. Some of them have similar interpretation, some of them – not, but 2 are completely new - Supervisor encouragement

of knowledge sharing and Informal knowledge sharing practices. They are both have a positive significant effect on innovation performance, and it is very interesting, that respondents' answers suggest two categories of knowledge sharing instead of one.

On this stage hypothesis H1 is rejected, as most of the scales are different in factor analysis ("All scales are feasible to measure impact of KM on innovation performance in Russian context"). Also hypothesis H3 and H5 are not supported ("Construct "learning mechanisms" is feasible to represent knowledge sharing practices impact on innovation performance", "Construct "work organization" is feasible to represent the impact of dependency on informal institutions on innovation performance"), because new learning mechanisms construct is related to individual learning, not knowledge sharing, and construct "work organization" is completely missing.

The description of new constructs

Supervisory work. Top-management of the company as a leading part of the company is constantly developing and updating their knowledge and try to share it with others: colleagues and employees in an open manner. Top-management allows employees to make mistakes because they understand that mistakes will happen and this should be seen as an opportunity to learn and solve the problems in a new more productive way. Even though this positivistic approach is shared in the company the employees are not encouraged to question existing/already obtained knowledge in the company. Mistakes and drawbacks that occur during the company performance may find its source in the previously gained knowledge that can be out of date or even wrong. Grounding on such type of incorrect knowledge can lead to further mistakes and a lag in the company development.

Strategy implementation. The strategy of the company is also being formulated towards the development of knowledge and competence of the company. This application is systematically being compared to the competitors to keep up with the conditions of the market. It also employs ideas and employees' points of view but does not give them the opportunity to participate in decision-making processes. This way the employees may feel frustrated or offended as their ideas are being used but they do not feel that this is their input.

Appraisal of the personnel. Employees of the company are rewarded in a material way for creating new knowledge/use of existing but are not rewarded materially for knowledge sharing. The processes of knowledge creation and usage are supported by the top management of the company during regular meetings and by the information technologies services that exist in the company. This practice interferes with the next one and shows that although the climate for developing knowledge in the company is supported it lacks the communication of the knowledge.

Employees create and generate knowledge, enrich their expertise and enhance their competences but may do not tend to share these resources due to the lack of reward.

Supervisor encouragement of knowledge sharing. Knowledge sharing among employees at working places is encouraged by the top management of the company (but not supported materially). Information technologies provided (Intranet, Internet, e-mail, e-learning) allow fast and easy access to the accumulated knowledge and create opportunities for shared work (but as it will be shown in recruitment section, groupware is not supported). This way employees help to update and re-formulate the strategy of the company. Here the company faces the obstacle that usually there is no particular position or person who guides this process of strategy renewal as the area of responsibility for strategic knowledge management is not clearly defined.

Knowledge-based Recruitment. While recruitment process the company is focused on the employees' abilities to learn and to develop and further the company assess the employee work by looking at how they create or share knowledge (although the knowledge sharing process is not supported materially), but the ability to apply/implement knowledge gained from others is not one of the criteria used to assess the performance of staff. Here we face the problem of the absence of knowledge exchange – a bilateral process when the knowledge is not only shared but also the knowledge recipient is providing in his turn the valuable knowledge.

Information Technology. Although information technologies help the companies to collect knowledge about competitors, consumers, and market environment to analyze this knowledge to proceed with better decisions they do not provide the possibility to share this information and knowledge with suppliers, customers, partners and other stakeholders. So the company appears to be a knowledge absorber and is not willing to share the lessons learned or best practice. Information technologies are also not used to develop new products and services, as well as new ideas about work processes. This sends us to supervisor encouragement, where already gained knowledge (for example, about working processes) are not questioned and are taken for granted.

Recruitment based on relations. Although informal communication is supported in the company as it promotes trust and the company is recruiting the personnel guided by competencies that correspond to the needs of the company this informal climate is more for communication during work processes as employees cannot make decisions in the company independently and the company in its way does not use the help of community of practice which is the example of the informal community inside the company. Shared work (groupware) is also not supported in the company although there are means for it.

Learning mechanisms. Employees' personal needs are discussed on a regular basis and the opportunities for learning and getting topical knowledge are provided by the company but the

company does not consider the opportunities to deepen and multiple employees' knowledge and competence. So the company provides the opportunity to enrich the knowledge that is needed for the working process but does not pay attention to the overall development of the employee. Also, employees do not have the opportunity to develop their competencies through training which is tailored to their needs (only the needs of the company are taken into account).

Information protection. Strategic knowledge of the company is protected from the access of those concerned to whom they are not intended. The company uses confidentiality, instructions for employees and other informal means to protect knowledge. This leads to the overprotective environment and the knowledge of the suppliers, customers, partners and other stakeholders of the company are also held inside.

Knowledge sharing practices. Within the help of mentoring, training, profile orientations knowledge is shared from experienced staff to less experienced. The company systematically uses the materials of "best practices" and lessons learned from the previous experience but does not systematically collect the materials for best practices and lessons learned from its own experience which leads us to the proposition that the company tends to absorb rather than generate.

After giving these descriptions, we defined constrains of usage of previous constructs.

Table 7. Construct differences

Original construct	The construct is applicable to Russian context	What is different in Russia?
Supervisory work	Yes	
Knowledge protection	Yes	
Strategic KM	No	The process of strategy creation is not transparent
Recruiting	No	More focused on individual skills and knowledge
Training and development	No	Opportunities depend on employees' skills of new knowledge application. Focus on development of knowledge sharing with external stakeholders.
Performance appraisal	Yes	
Compensation practices	No	Rewards depend on employee's relations with supervisor and general company competitive advantages. Knowledge sharing is not included in this block.
Learning mechanisms	Yes	
IT practices	No	KM IT is not used for product development; external data collection perceived as better decision making
Work organization	No	No idea about communities of practice. Self-dependence of employees is not perceived as an organizational issue.
Supervisor encouragement of knowledge sharing	No	it is an additional scale

The main Russian pecularities and constrains

1. Employees are not encouraged to doubt existing knowledge
2. Process of strategy establishment is not transparent
3. Employees don't know the strategy of the company
4. In a recruitment process individual knowledge and skills are valued higher than communication and collaboration skills
5. An employee is not rewarded in a material way for knowledge sharing
6. Usage of IT system to collect knowledge about external environment perceived as it directly leads to better decision making
7. Decisions are made in an authoritarian way (less autonomous employees)
8. Management of the company consciously use IT systems to achieve easier knowledge sharing

Guidelines or directives questions for the further interview

Found peculiarities and constrains should be supported by further research. Possible methods are interview, survey, or even confirmation via secondary data (cultural studies), e.g. constrain #7 is supported by Hofstede cultural dimension model.

1. How often is the existing knowledge that is used on a regular basis being updated? Are there any procedures for reconsidering information/content/knowledge obtained before? How do you eliminate e the knowledge you do not use?

2. What is the process of idea implementation of an employee in your company? How do you reward the employee that proposed the idea that was implemented further?
3. How do you reward the sharing of the knowledge? How do you track this process?
4. How does the creation of new knowledge affect the strategy of the company? Are there any procedures or processes that can track the idea from its discussion to implementation?
5. How do employees obtain knowledge from their colleagues? Is this process is encouraged or rewarded?
6. How do you use IT for creating new products or implementing ideas for working processes? To what extent IT help/encourages this process
7. Do you have the communities of practice (both formal and/or informal) and what is their role in the company? Do you ask for their help while making complex decisions in your company?
8. What are the options for employee learning? How do you establish the training programs for the employees? Are employees' needs taken into account or is it a more obligatory procedure?
9. To what extent the company's knowledge is protected? Are their rules or guidelines that set the particular boundaries?

To sum up, the study has shown how consideration of local peculiarities could add significant value to the practical application of the model, increase overall fitness of the model and contribute to creation of universal conceptual model.

CONCLUSIONS

Conclusion

Academic application

Scales, suggested by Inkinen and Vanhala, were adjusted for measurement of KM impact on innovation performance in the Russian context. Recent data on innovation performance and knowledge management practices have been collected. Also constraints for knowledge management application to each managerial activity have been identified.

In general, this study contributes to cross-cultural research in KM field. Despite it is generally agreed, that KM's theory base is universal, some recent studies provide an empirical evidence of variance of managerial assessment of KM practices in different contexts. Thus, managers and researchers should keep in mind, that evaluation of KM performance could be dependent on external factors, such as cultural and institutional differences.

In general, researchers haven't agreed on a one single universal model to assess KM performance. This research suggests alignment of the recently developed scales for measurement less developed state of knowledge management, and, therefore, contributes to the creation of such universal model.

Business application

The single managerial activity, which has a significant impact on innovation performance, has been identified. Managers could stress strategic management of knowledge to achieve higher innovation performance of the company. Inkinen and Vanhala put a meaning of performing all strategy-related activities, considering intangible assets – skills and knowledge of the company. Understanding that knowledge assets are also valuable for the company. Create a strategy based on firm's knowledge pool, develop knowledge to achieve strategic goals, think in terms of knowledge of the company, not individuals' – these are recommendations we could give to the managers, who are willing to boost innovation performance.

It is important to be aware of cultural differences. Contemporary KM research findings could be not applicable in the local context. For example, focus on knowledge sharing is a known Russian peculiarity, however, it was underrepresented in the research. Another finding is that here employees distinguish supervisors' encouragement to share knowledge, and unofficial established sharing processes. Both of these constructs have a positive impact on innovation performance, so they don't compete but rather complement one another.

Also constraints in each constant managerial activity have been defined. The main limitation in Strategic KM is that employees do not see the development of their knowledge as a strategic goal of the company.

Overall, results are applicable for all Russian companies of medium to large size and with the existence of R&D department (or another innovation-related department), striving to increase their innovation performance.

Limitations

This study hasn't compared current state of KM with the previous one. Cultural research is quite new for the field of KM, and there are few significant peculiarities are defined. There might be much more of them, and a careful research on significance of their impact is required.

Knowledge management practices could be underdeveloped in some companies, which cause a significant skewness in findings. In other words, KM practices could be established formally, but be actually dysfunctional, as suggested in May and Stewarl 2013.

Finally, accessibility of data is an important constraint – other data sources could be used to collect larger sample size.

Further research

There is no doubt that knowledge management becomes more and more popular. Thus, measurement of the effectiveness of these practices should be done repeatedly. We suggest using adjusted scales for estimation of knowledge management practices impact on innovation performance of the Russian company through continuous managerial activities. This way not only a cross-sectional data but also a panel dataset could be collected to track the development of these practices in Russian MNEs.

We assume that this set of scales may be not complete. Thus, they could be tested on a larger sample, compared with other countries' data, etc. A careful research on significance of the impact of cultural peculiarity on KM activities is suggested. Moreover, found constrains could be further investigated.

Finally, a more complex structural model for PLS path modelling could be build, including more external variables, or additional latent ones.

LIST OF REFERENCES

1. Andreeva T., and A. Kianto. “Does Knowledge Management Really Matter? Linking Knowledge Management Practices, Competitiveness and Economic Performance.” *Journal of Knowledge Management* 16, no. 4 (July 13, 2012): 617–36. https://doi.org/10.1108/13673271211246185.
2. Andreeva T., and A. Kianto. “Knowledge Processes, Knowledge-intensity and Innovation: A Moderated Mediation Analysis.” Journal of Knowledge Management 15, no. 6 (October 25, 2011): 1016–34. https://doi.org/10.1108/13673271111179343.
3. Avdeeva I.L. “Developing the information infrastructure of management under knowledge economy formation” Economic analysis: Theory and Practice, Vol. 16. no 3. (2017): 521-32 ISSN: 2073-039X
4. Blair, G., & K. Imai. 2012. Statistical Methods for the Item Count Technique and List Experiment. Comprehensive R Archive, Network (CRAN).
5. Bogner, W. C., and P. Bansal. “Knowledge Management as the Basis of Sustained High Performance.” *Journal of Management Studies* 44, no. 1 (January 2007): 165–88. https://doi.org/10.1111/j.1467-6486.2007.00667.x.
6. Cabrera, E. F., and A. Cabrera. “Fostering Knowledge Sharing through People Management Practices.” *International Journal of Human Resource Management* 16, no. 5 (May 2005): 720–35. https://doi.org/10.1080/09585190500083020.
7. Carrillo P, H. Robinson, C. Anumba, and A. Al-Ghassani. “IMPaKT: A Framework for Linking Knowledge Management to Business Performance.” *Electronic Journal of Knowledge Management* 1, no. 1 (March 2003).
8. Ciabuschi, F., and O. M. Martín. “Knowledge Ambiguity, Innovation and Subsidiary Performance.” Baltic Journal of Management 7, no. 2 (April 13, 2012): 143–66. https://doi.org/10.1108/17465261211219787.
9. Darroch, J. “Knowledge Management, Innovation and Firm Performance.” *Journal of Knowledge Management* 9, no. 3 (January 1, 2005): 101–15. https://doi.org/10.1108/13673270510602809.
10. Domenech, J., R. Escamilla, and N. Roig-Tierno. “Explaining Knowledge-Intensive Activities from a Regional Perspective.” Set-Theoretic Research in Business 69, no. 4 (April 1, 2016): 1301–6. https://doi.org/10.1016/j.jbusres.2015.10.096.
11. Donate, M.J., and F. Guadamillas. “Organizational Factors to Support Knowledge Management and Innovation.” *Journal of Knowledge Management* 15, no. 6 (January 1, 2011): 890–914. https://doi.org/10.1108/13673271111179271.
12. European Commission, “Regional Innovation Scoreboard”, European Commission (2014)

13. Foss, N.J., K. Husted, and S. Michailova. “Governing Knowledge Sharing in Organizations: Levels of Analysis, Governance Mechanisms, and Research Directions.” *Journal of Management Studies* 47, no. 3 (May 1, 2010): 455–82. https://doi.org/10.1111/j.1467-6486.2009.00870.x.
14. Giampaoli D., M. Ciambotti, and N. Bontis. “Knowledge Management, Problem Solving and Performance in Top Italian Firms.” *Journal of Knowledge Management* 21, no. 2 (April 3, 2017): 355–75. https://doi.org/10.1108/JKM-03-2016-0113.
15. Hair, J., T. Hult, C. Ringle, and M. Sarstedt. A Primer on Partial Least Squares Structural Equation Modeling, 2014.
16. Hair, J., Black, W., Babin, B., & Anderson, R. 2011. Multivariate Data Analysis: A Global Perspective. Pearson, New Jersey, NJ.
17. Hussinki H., A. Kianto, M. Vanhala, and P. Ritala. “Assessing the Universality of Knowledge Management Practices.” Journal of Knowledge Management 21, no. 6 (September 8, 2017): 1596–1621. https://doi.org/10.1108/JKM-09-2016-0394.
18. Kannan G., and W. G. Aulbur. “Intellectual Capital: Measurement Effectiveness.” *Journal of Intellectual Capital* 5, no. 3 (September 1, 2004): 389–413. https://doi.org/10.1108/14691930410550363.
19. Grayson, C. J., and C. O’dell. *If Only We Knew What We Know: The Transfer of Internal Knowledge and Best Practice*. 1 edition. Place of publication not identified: Free Press, 2012.
20. Heisig, P. “Harmonisation of Knowledge Management : Comparing 160 KM Frameworks around the Globe.” *Journal of Knowledge Management* 13, no. 4 (January 1, 2009): 4–31. https://doi.org/10.1108/13673270910971798.
21. Ibrahim, F., and V. Reid. “What Is the Value of Knowledge Management Practices?” *Electronic Journal of Knowledge Management* 7, no. 5 (December 2009): 567–74.
22. Ing-Long Wu, and Jian-Liang Chen. “Knowledge Management Driven Firm Performance: The Roles of Business Process Capabilities and Organizational Learning.” *Journal of Knowledge Management* 18, no. 6 (January 1, 2014): 1141–64. https://doi.org/10.1108/JKM-05-2014-0192.
23. Inkinen, H.T., A. Kianto, and M. Vanhala. “Knowledge Management Practices and Innovation Performance in Finland.” *Baltic Journal of Management* 10, no. 4 (September 29, 2015): 432–55. https://doi.org/10.1108/BJM-10-2014-0178.
24. Kalling, T. “Knowledge Management and the Occasional Links with Performance.” *Journal of Knowledge Management* 7, no. 3 (January 1, 2003): 67–81. https://doi.org/10.1108/13673270310485631.
25. Khalifa, M., A.Y. Yu, and K.N. Shen. “Knowledge Management Systems Success: A Contingency Perspective.” *Journal of Knowledge Management* 12, no. 1 (January 1, 2008): 119–32. https://doi.org/10.1108/13673270810852430.

26. Kianto, A., and T. Andreeva. “Knowledge Management Practices and Results in Service-Oriented versus Product-Oriented Companies.” Knowledge and Process Management 21, no. 4 (October 1, 2014): 221–30. https://doi.org/10.1002/kpm.1443.
27. Kulkarni, U.R., S. Ravindran, and Ronald Freeze. “A Knowledge Management Success Model: Theoretical Development and Empirical Validation.” *Journal of Management Information Systems* 23, no. 3 (Winter2006/2007 2006): 309–47.
28. Liebowitz, J, and K Wright. “Does Measuring Knowledge Make ‘cents’?” *Expert Systems with Applications* 17, no. 2 (August 1999): 99–103. https://doi.org/10.1016/S0957-4174(99)00027-5.
29. May R. C., Stewarl W. H. “Building Theory with BRICs: Russia’s Contribution to Knowledge Sharing Theory.” Critical Perspectives on International Business, Vol. 9. no. 1/2. (2013): 147–172. ISSN: 1742-2043
30. Mu-Jung Huang, Mu-Yen Chen, and Kaili Yieh. “Comparing with Your Main Competitor: The Single Most Important Task of Knowledge Management Performance Measurement.” *Journal of Information Science* 33, no. 4 (August 2007): 416–34. https://doi.org/10.1177/0165551506076217.
31. Nonaka I., and H. Takeuchi. *The Knowledge-Creating Company: How Japanese Companies Create the Dynamics of Innovation*. Oxford University Press, 1995. https://books.google.ru/books?id=B-qxrPaU1-MC.
32. O’Dell C., and C. J. Grayson. “If Only We Knew What We Know: IDENTIFICATION AND TRANSFER OF INTERNAL BEST PRACTICES.” *California Management Review* 40, no. 3 (Spring 1998): 154–74.
33. Puffer, Sheila M., and Daniel J. McCarthy. “Two Decades of Russian Business and Management Research: An Institutional Theory Perspective.” *Academy of Management Perspectives* 25, no. 2 (2011): 21–36.
34. Ragab M.A.F., and Amr Arisha. “Knowledge Management and Measurement: A Critical Review.” *Journal of Knowledge Management* 17, no. 6 (October 21, 2013): 873–901. https://doi.org/10.1108/JKM-12-2012-0381.
35. Lee S., B.G. Kim, and H. Kim. “An Integrated View of Knowledge Management for Performance.” *Journal of Knowledge Management* 16, no. 2 (January 1, 2012): 183–203. https://doi.org/10.1108/13673271211218807.
36. Shirokova G. V., Bystrova Y. E. “Organizational Changes in Russian New Ventures as a Factor of Success.” Vestnik of Saint-Petersburg State University, Management, Series 8, no. 2 (2014): 60–69. ISSN: 1605-7953

37. Shu-Hui Chuang. “A Resource-Based Perspective on Knowledge Management Capability and Competitive Advantage: An Empirical Investigation.” *Expert Systems with Applications* 27, no. 3 (October 1, 2004): 459–65. https://doi.org/10.1016/j.eswa.2004.05.008.
38. Tanriverdi, H. “Information Technology Relatedness Knowledge Management Capability, and Performance of Multibusiness Firms.” *MIS Quarterly* 29, no. 2 (June 2005): 311–34.
39. Zack, M., J. McKeen, and S. Singh. “Knowledge Management and Organizational Performance: An Exploratory Analysis.” *Journal of Knowledge Management* 13, no. 6 (January 1, 2009): 392–409. https://doi.org/10.1108/13673270910997088.

APPENDIX

Appendix 1. Table of descriptive analytics by questions.

ID		Mean	SD	Question (in Russian)
DV Innovation Performance (dependent)				
B5	A	3,78	1,70	Товары и услуги для потребителей
B5	B	3,92	1,45	Способы и процессы производства
B5	C	4,13	1,36	Практики управления
B5	D	4,18	1,61	Приёмы маркетинга
B5	E	4,05	1,61	Бизнес-модели
IV1 Supervisory work				
B11	A	4,01	1,68	Руководители поощряют сотрудников делиться знаниями на рабочих местах
B11	B	3,74	1,52	Руководители поощряют сотрудников сомневаться в существующих знаниях
B11	C	3,78	1,47	Руководители позволяют сотрудникам ошибаться и видят ошибки как возможность научиться чему-то новому
B11	D	4,28	1,41	Руководители ценят идеи и точки зрения сотрудников и принимают их во внимание
B11	E	4,11	1,36	Руководители содействуют равноправному обсуждению на рабочих местах
B11	F	4,24	1,37	Руководители делятся знаниями в открытой и равноправной манере
B11	G	4,27	1,42	Руководители постоянно обновляют/улучшают/совершенствуют свои знания
IV2 Knowledge protection				
B15	E	4,26	1,35	Стратегические знания компании защищены от доступа тех заинтересованных лиц, которым они не предназначаются
B14	H	4,04	1,43	Компания обладает превосходством в технологической сфере
B15	F	4,31	1,36	Компания использует конфиденциальность, инструкции для сотрудников и другие неформальные средства для защиты знаний
IV3 Strategic management of knowledge and competencies				
B10	A	3,94	1,61	Стратегия формулируется и обновляется на основе знаний и компетенций компании
B10	B	4,13	1,43	Стратегия компании направлена на развитие знаний и компетенций
B10	C	3,96	1,35	Стратегическое знание и компетенция компании систематически противопоставляются с конкурентными
B10	D	3,94	1,40	Зона ответственности за стратегическое управление знаниями четко определена и находится в ведении специального человека
IV4 Knowledge-based human resources management				
B13	T	4,23	1,37	При подборе персонала компания ориентируется на компетенции, соответствующие нуждам компании
B13	U	4,22	1,40	При подборе персонала компания ориентируется на способности сотрудника учиться и развиваться
B13	L	4,12	1,39	Совместная работа и взаимодействие между работниками признается в компании и/или поощряется

IV5 Knowledge-based training

B13	P	4,10	1,48	Сотрудникам представляют возможности углубить и приумножить свои знания и компетентность
B13	Q	4,05	1,47	Компания предлагает обучение, которое предоставляет сотруднику актуальные знания
B13	R	4,10	1,36	Сотрудники имеют возможность развивать свои компетенции через обучение, которое подбирается с учётом их потребностей
B13	S	3,92	1,40	Потребности сотрудника обсуждаются с ними регулярно

IV6 Assessment of employees

B13	M	4,06	1,39	Передача знаний это один из критериев, который используется в компании для оценки работы персонала
B13	N	4,03	1,40	Создание нового знания это один из критериев, который используется в компании для оценки работы персонала
B13	O	4,06	1,41	Способность применять знания, полученные от других, это один из критериев, который используется для оценки работы персонала

IV7 Knowledge-based rewards

B13	E	3,97	1,42	Передача знаний между сотрудниками и/или командами материально поощряются в компании
B13	G	4,04	1,53	Компания вознаграждает/материально поощряет сотрудников за создание нового знания
B13	I	4,08	1,50	Компания материально поощряет сотрудников за использование знаний

IV8 Learning mechanisms

B12	S	4,33	1,34	Знания передаются от опытных сотрудников к менее опытным через менторство/наставничество, обучение, профильные ориентации
B12	T	4,15	1,46	Компания систематически собирает материалы «лучших практик» и уроков, извлечённых из предыдущего опыта
B12	U	4,17	1,47	Компания систематически использует материалы «лучших практик» и уроков, извлечённых из предыдущего опыта

IV9 IT practices

B14	B	4,27	1,37	Информационные технологии, которые использует компания, обеспечивают быстрый и лёгкий доступ к накопленной информации
B14	A	4,00	1,65	Информационные технологии, которые использует компания (к примеру, Интранет, Интернет, электронную почту и электронное обучение), создают возможности для совместной работы и взаимодействия
B14	C	4,17	1,34	Информационные технологии, которые использует компания, обеспечивает передачу информации и знаний поставщикам, клиентам, партнёрам и другим заинтересованным лицам
B14	D	4,20	1,43	Информационные технологии используются в компании, чтобы анализировать знания, которые помогут принимать лучшие решения
B14	E	4,19	1,43	Информационные технологии используются в компании, чтобы собирать знания о конкурентах, потребителях и окружающей среде
B14	F	4,29	1,30	Информационные технологии используются в компании, чтобы развивать новые продукты и сервисы, а также новые идеи о рабочих процессах

IV10 Work organization

B16	E	4,11	1,36	Работники имеют возможность участвовать в процессе принятия решений
B16	F	4,02	1,40	Должностные обязанности сформулированы таким образом, чтобы позволить сотруднику независимо принимать решения
B16	G	4,20	1,43	Неформальное общение возможно между сотрудниками
B16	H	4,31	1,34	Личные встречи сотрудников с руководителем организуются по необходимости
B16	I	4,17	1,43	По необходимости компания использует помощь сообщества практиков

Appendix 2. Interpretation of new constructs.

#	KM practice	Description	Constraints	Hypotheses propositions	Preliminary effect on innov. perf.
1	Supervisory work	Top-management of the company is constantly developing and updating their knowledge and shares it among others. Top-management allows employees to make mistakes and see them as an opportunity to learn.	The employees are not encouraged to question existing knowledge	Questioning the existing knowledge and working processes may have positive effect on avoiding mistakes	Non-significant
2	Strategy implementation	The strategy of the company is also applied for the development of knowledge and competence. The application is systematically compared to the competitors. Ideas and employees' points of view are considered and valued.	The employees do not see development of their knowledge as a strategic goal of the company	Communication of strategic goal to develop employees' knowledge has a significant positive effect on company's innovation performance	+0,22**
3	Appraisal of the personnel (rewards)	Employees of the company are rewarded in material way for creating new knowledge/use of existing. The employees also have access to the technological instruments that help the process of knowledge exchange and that the company obtains. The employees also have the possibility to meet with the top-management to discuss issues and get support	Employees of the company are not rewarded for knowledge sharing and autonomous decision-making.	Including knowledge sharing into the work assessment will enhance the knowledge sharing practice	Non-significant
4	Knowledge sharing (supervisors' decision to use IT software for knowledge sharing)	Knowledge sharing between employees at working places is encouraged by the top-management of the company. Information technologies provided (Intranet, Internet, e-mail, e-learning) allow fast and easy access to the accumulated knowledge and create opportunities for shared work. Strategy of the company is updated and formulated on the basis of company knowledge.	Existence of IT system for knowledge sharing works as a formal sign for employees of importance of this process to the company	KM IT infrastructure helps people to understand strategic goals of the company	+0,13*
5	Knowledge-based Recruitment	While recruitment process the company is focused on the employees' abilities to learn and to develop. After the person is hired the company assesses his/her work by several	The ability to apply/implement knowledge gained from others is not one of the criteria used to assess the performance of staff		Non-significant

		criteria – two of them are creation of the new knowledge and knowledge sharing.			
6	IT	Information technologies are used in the companies to collect knowledge about competitors, consumers and market environment and to analyze this knowledge to proceed with better decisions.	Information technologies do not ensure the sharing of information and knowledge to suppliers, customers, partners and other stakeholders Information technology is not used in the company to develop new products and services, as well as new ideas about work processes	More intense use of IT may lead to more productive knowledge exchange processes	Non-significant
7	Relation-based Recruitment	Informal communication and collaboration are important skills for the company. That is why it is an acceptable strategy to recruit personnel via networking and interpersonal relations			Non-significant
8	Learning (personal development)	Employees' needs are discussed on a regular basis and the opportunities for learning and getting topical knowledge are provided by the company.	Employees do not have opportunities to deepen and multiply their knowledge and competence. Employees do not have the opportunity to develop their competencies through training which is tailored to their needs	More sophisticated personnel development programs will enhance KM in the company	Non-significant
9	Information protection	Strategic knowledge of the company is protected from the access of those concerned to whom they are not intended. The company uses confidentiality, instructions for employees and other informal means to protect knowledge.		Understanding the need to protect information means the understanding of value of knowledge within the company	+0,11*
10	Knowledge sharing (people-based)	Knowledge is shared from experienced staff to less experienced through mentoring, training, profile orientations. The company systematically uses the materials of "best practices" and lessons learned from the previous experience.	The company does not systematically collect the materials for best practices and lessons learned from its own experience		+0,16**

Appendix 3. Factor analysis.

			1	2	3	4	5	6	7	8	9	10
Руководители позволяют сотрудникам ошибаться и видят ошибки как возможность научиться чему-то новому	1	IV1_C	,556									
Руководители содействуют равноправному обсуждению на рабочих местах	1	IV1_E	,612									
Руководители делятся знаниями в открытой и равноправной манере	1	IV1_F	,659									
Руководители постоянно обновляют/улучшают/совершенствуют свои знания	1	IV1_G	,697									
Зона ответственности за стратегическое управление знаниями четко определена и находится в ведении специального человека	3	IV3_D		,484								
Руководители ценят идеи и точки зрения сотрудников и принимают их во внимание	1	IV1_D		,545								
Стратегическое знание и компетенция компании систематически противопоставляются с конкурентными	3	IV3_C		,645								
Стратегия компании направлена на развитие знаний и компетенций	3	IV3_B		,679								
Должностные обязанности сформулированы таким образом, чтобы позволить сотруднику независимо принимать решения	10	IV10_F			,457							
Личные встречи сотрудников с руководителем организуются по необходимости	10	IV10_H			,501				,499			
Компания материально поощряет сотрудников за использование знаний	7	IV7_I			,567							
Компания обладает превосходством в технологической сфере	2	IV2_H			,610							
Компания вознаграждает/материально поощряет сотрудников за создание нового знания	7	IV7_G			,647							
Стратегия формулируется и обновляется на основе знаний и компетенций компании	3	IV3_A				,597						
Информационные технологии, которые использует компания, обеспечивают быстрый и лёгкий доступ к накопленной информац	9	IV9_B				,610						
Руководители поощряют сотрудников делиться знаниями на рабочих местах	1	IV1_A				,654						
Информационные технологии, которые использует компания (к примеру, Интранет, Интернет, электронную почту и электронно	9	IV9_A				,745						
Создание нового знания это один из критериев, который используется в компании для оценки работы персонала	6	IV6_N					,571					
Передача знаний это один из критериев, который используется в компании для оценки работы персонала	6	IV6_M					,606					
При подборе персонала компания ориентируется на способности сотрудника учиться и развиваться	4	IV4_U					,694					
Информационные технологии используются в компании, чтобы собирать знания о конкурентах, потребителях и окружающей ср	9	IV9_E						,821				
Информационные технологии используются в компании, чтобы анализировать знания, которые помогут принимать лучшие реш	9	IV9_D						,828				
Совместная работа и взаимодействие между работниками признается в компании и/или поощряется	4	IV4_L							,473			
При подборе персонала компания ориентируется на компетенции, соответствующие нуждам компании	4	IV4_T							,511			
Неформальное общение возможно между сотрудниками	10	IV10_G							,643			
Способность применять знания, полученные от других, это один из критериев, который используется для оценки работы персон	6	IV6_O								,459		
Сотрудникам представляют возможности углубить и приумножить свои знания и компетентность	5	IV5_P								,482		
Информационные технологии, которые использует компания, обеспечивает передачу информации и знаний поставщикам, клие	9	IV9_C								,495		
Потребности сотрудника обсуждаются с ними регулярно	5	IV5_S								,561		
Компания предлагает обучение, которое предоставляет сотруднику актуальные знания	5	IV5_Q								,665		
Компания использует конфиденциальность, инструкции для сотрудников и другие неформальные средства для защиты знаний	2	IV2_F									,634	
Стратегические знания компании защищены от доступа тех заинтересованных лиц, которым они не предназначаются	2	IV2_E									,728	
Компания систематически собирает материалы «лучших практик» и уроков, извлечённых из предыдущего опыта	8	IV8_T										,489
Компания систематически использует материалы «лучших практик» и уроков, извлечённых из предыдущего опыта	8	IV8_U										,556
Знания передаются от опытных сотрудников к менее опытным через менторство/наставничество, обучение, профильные ориент	8	IV8_S										,599